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ABSTRACT

Papers on science and technology libraries which were presented at the 1986 International Federation of Library Associations (IFLA) conference include: (1) "Online Information Service of the Japan Information Center of Science and Technology" (Ryuko Igarashi, Japan); (2) "A View from the Chip--The Influence of Information Technologies on Libraries and Librarianship" (Pat Molholt, United States); (3) "Adumbrations on the Information Support Centre" (Allan Horton, Australia); (4) "The Influence of Information Technologies on Libraries and Librarianship--Ideas from Another Point of View" (Dieter Schmidmaier, East Germany); (5) "Cooperation between Representatives of Different Occupational Groups in Construction and Equipping of Technical Libraries in the 21st Century" (Dieter Schmidmaier, East Germany); (6) "The United Nations University Proposal for an Archive of Traditional Knowledge--Implications for Scientific Communities" (Walter Shearer, United Nations University, Japan); (7) "A Developing Country Response to Pat Molholt's 'A View from the Chip--The Influence of Information Technologies on Libraries and Librarianship'" (Syed Salim Agha, Malaysia); and (8) "Project Emperor-I: China's Treasure Revealed via Videodisc Technology" (Ching-chih Chen and Robert D. Stueart, United States). (KM)

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IFLA GENERAL CONFERENCE, TOKYO

1986

Division: Special Libraries

Section: Science and Technology Libraries

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On-line information service of the Japan Information Center of Science and Technology.

by

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On-line information service of the Japan Information Center of Science and Technology

1. Introduction

The Japan Information Center of Science and Technology (JICST) is one of the most comprehensive service centers of scientific and technical information in Japan.

Since its establishment in 1957 as a non-profit organi-zation regulated by the Science and Technology Agency, Prime Minister's Office, JICST has been contributing not only to industries but to universities and research insti-tutions by undertaking information activities such as gathering and processing every year a total of up to 500,000 scientific citations from throughout the world.

At present, JICST has been continuing to costruct the databases in Japanese, and has dedicated to provide database service through JICST Online Information System (JOIS).

Recently, Japan has made great strides in high technology and has attained a remarkable economic growth. JICST has been rendering comprehensive services in a wide range of fields including technical developments, innovations and research activities which have constituted the base of Japan's present progress and growth.

It has been our long-cherished and sincere desire to make the JICST services and products available world-widely, and thus to contributing to mutual scientific, technological and economic development among nations.

To achieve this goal, JICST has recently arranged and enhanced its system so that foreign customers could also benefit from our services more efficiently and effectively.

We would like to take this opportunity to introduce the following services and products JICST currently offers and will offer in the near future.

2. JICST services currently available

JICST Online Information System (JOIS)

This information retrieval system has been developed by JICST and is equipped with versatile retrieval functions covering the latest Japanese information in every field of science and technology.

It is attracting world-wide attention for its distinguished capabilities in terms of simple operation and abundant information. Databases now available are:

(1) JICST File on Science and Technology
(4,700,000 citations)
(2) JICST File on Medical Science in Japan
(290,000 citations)
(3) JICST File on Current Science and Technology Research in Japan (32,000 themes)
(4) JICST File on Government Reports in Japan
(7,000 reports)
(5) Nikkan Kogyo Newspaper File on New Technology and Products in Japan (50,000 citations)

As a example, one of these bibliographic databases, (1) is called JICST file on science and technology which reaches a total of about a half million abstracts annually.

The range of the JICST File covers the entire fields of science and technology, from the basics to the applications.

Total number of abstracts accumulated in the File now reaches about five million. The data elements included are bibliographic items, titles, abstracts, classification codes, key words, author names, author affiliations, etc.

Of the literatures concerning science and technology, those published in Japan are about 118,000 articles, the rest being those published in other countries.

These articles are selected from about 10,000 journals, conference proceedings, technical reports and other publications. Patent specifications and books are not included.

At present, these 5 databases are written in Japanese, but an English version for(1) and (2) is scheduled to become available in September, 1986.

In recent years, in parallel with the progress being made in the research and development in the fields of science and technology in Japan, JICST decided to provide scientific and technological information of Japanese origin on a worldwide scale.

According to a survey conducted by the Japan Information Center of Science and Technology (JICST), it is shown that users of online database in North America (USA and Canada) perceiving the need of Japan's information of science and technology account for as much as 73%.

To meet these needs satisfactorily, JICST has recently arranged and enhanced its system so that all of the users could enjoy various services more efficiently and effec--tively. Through such services,JICST expects that the cooperation between Japan and foreign countries shall be enhanced. In this respect, JICST has been offering the JICST Files in Japanese character, Kanji to West Germany, Republic of Korea, France and United Kingdom since 1985.

3. JICST services available in the near future

To meet the rapidly increasing demand in foreign countries for science and technological information of Japan in these years, JICST has recently decided to launch providing database service in English language for those users in abroad.

This is indeed an epoch-making scheme in which almost all scientific and technological literatures generated in Japan are collected and translated, and thereby provided to every corners of the world.

By utilizing this service, we are confident that users will become able to obtain appropriate understanding on the present status and trends of all the R&D in the field of science and technology in Japan.

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(1) JICST English Database through JOIS

JICST is now compiling an English-language database, whose online access will be made available overseas in September 1986 through the JOIS system.

The database will virtually cover all subjects ranging from science and technology to medicine and pharmacology.

The database is to be composed of initially about 216,000 citations selected and indexed from 5,000 domestic journals including technical reports and conference proceedings and is to be expanded with an annual increase of 160,000 citations thereafter.

The data elements to be compiled in the English database will, for the present, include English titles, English key words, classification codes, author names in Romanized Japanese, author affiliations, journal titles in English or Romanized Japanese and English abstracts.

As for the English abstracts, only a part of the abstracts are compiled in English for the present, but all of them will eventually be compiled in English when the machine translation system will become practical.

(A) CONVERSION FROM JAPANESE INTO ENGLISH

When providing the scientific and technological information generated in Japan to foreigh users, the biggest problem facing us has been that most of the original literatures are written in Japanese.

The on-line service of secondary information in Japanese using terminals would be insufficient for non-Japanese especially considering the facts that there are few people who can understand Japanese and that the Kanji terminal, which can print the output in Kanji characters, actually does not exist outside Japan.

The most difficult problem we are facing now is to find the means of converting the voluminous amount of information in Japanese into English since the machine translation system is yet to be completed.

The data to be translated from Japanese into English are the data elements constituting the English database, such as, the titles, key words, author names, author affiliations, etc., and the tools for information retrieval such as the Thesaurus, classification table, etc.

Among the data elements of the English database to be compiled in 1985, those using the automatic conversion system for key words, the conversion system into English for the search tools, are explained hereunder.

(B) Automatic conversion system for key words

The JICST Thesaurus is Japan's only comprehensive thesaurus for scientific and technological information terms, which has been obtained as a result of several revisions. This thesaurus consists of about 40,000 entries. However, since this Thesaurus has been constructed based on the concepts of the Japanese lauguage, it is essential that,

the JICST English Thesaurus is to be constructed as based on English concepts, rather than as a word-for-word mere translation of the orginal Thesaurus in Japanese.

In order to construct the JICST English Thesaurus at the earliest possible opportunity, we are currently carrying out various types of work. As the first step, we have collected the English terms corresponding to the Japanese key words in the JICST Thesaurus and compiled a list of Japanese terms and their corresponding English.

The English database to be compiled 1985 will compile the English key words resulting from the matching of the Japanese key words stored in the JICST File with the Japanese key words registered in the list.

(2) JICST standard SDI service.

Furthermore, more than 200 themes of standard SDI will also be serviced in every month.

Designed to keep customers up-to date in every field of science and technology including medicine and pharmacology, the standard SDI service provides the latest information in Japan's R&D scene on a monthly basis.

The SDI service has earned a reputation among researchers and businessmen at all levels for being informative and highly useful in their efforts in R&D.

Here is a partial list of "STANDARD" SDI subjects available in the service.

* Linear integrated circuit
* Digital intergrated circuit
* Super LSI
* Power electronics
* Artificial intelligence
* Microcomputer
* Picture processing
* Application technique of microwave
* Utilization of ceramic to electronic industry
* Hydraulics and its applied technology
* Numerically controlled machine tool
* Industrial robots
* Fitting-out of automobiles
* Antiviral medicine
* Artificial organs

4. FUTURE DEVELOPMENTS

Future developments that we must do is to increase the volume and kinds of information to be offered. For example, there is the possibility of converting such files currently offered on JOIS as the JICST File on Current Science and Technology Research in Japan, information about the subjects of researches conducted at some 600 public laboratories and research organizations in Japan and the Government Reports in Japan.

Second, there is the need of enhancing the value of the data. In this connection, it will be essential to expedite the development of the machine translation system in order to speed up the preparation and service of English databases and to achieve the goal of including all the abstracts available in English.

In Japan, several systems developed by computer manufacturers have been marketed.

On the other hand, JICST has launched a research project on an advanced machine translation system since 1982 jointly with Kyoto University, andthe Electrotechnical Laboratory of the MITI.

The machine traslation system which is still under going further improvement has demonstrated its capabilities by translating Japanese abstracts into English.

In the international flow of information, the biggest problem at present is the language barrier. In order to solve this problem, the machine translation system is expected to contribute a great deal in the future.

Since there is an increasing trend in the Japanese journals to add English titles and English abstracts, the language barrier in the field of science and technology may disintegrate earlier than we expect.

JICST will endeavour to promote the smooth flow of scientific and technological information of Japanese origin.

IFLA GENERAL CONFERENCE, TOKYO

Division: Special Libraries

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A view from the Chip:

The influence of information technologies on libraries and librarianship

by

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The influence of information technologies on libraries and librarianship.

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Introduction

Librarians have long been undervalued. Our work is treated as routine and our skills go unrecognized. Our image and our salary suffer. That's the bad news. The good news is that expert systems, the leading edge of the new information technologies, offer librarians an exciting area in which to carry their profession to a higher level of achievement and recognition.

To be offering my thoughts on this sweeping topic at this meeting is a particular honor and a challenge. To information managers in the United States, and in many other industrialized countries, Japan embodies a vision unsurpassed anywhere else in the world. Japan's ambition to harness both information and knowledge is all the more impressive for being underpinned by plans, people, and funding. Although some ask "is it possible" or "who will get there first", for us as librarians the more

immediate questions are "how will the evolving technologies affect us" and "what might we do to fulfill our role in the knowledge-based society where all of us will live and work?"

I suggest there are both traditional and non-traditional roles for us and, particularly for those challenged by the information technologies, there will need to be changes in our training programs and in the ways we perceive our work and our functions.

Twenty-five Centuries of History

The interaction between technology and work is a popular, not to say ubiquitous, issue. Every airline magazine and every newspaper business section speaks of it, in tones ranging from utopian to alarmist. As the physicist Niels Bohr once said, "It is difficult to predict, especially about the future." The actual impact of technology is complex and often very different from what was predicted; for every example of a positive consequence there are negative concerns. A recent article by Derek Bok, President of Harvard University, offered a series of examples of the use of information technologies in education[1]. While he makes clear that new technologies eliminate a great deal of drudgery, their real educational benefits remain in dispute. This hard-headed weighing of benefits is occuring across all areas of application. The most definitive statement one can make is, it's too early to tell.

Why, then, do I venture onto this shifting and uncertain ground? In part because this is far from a new experience for us. Libraries have twenty-five centuries of history and they have always adapted to technology and even, in more recent times, pioneered it. If we are to keep pace with our environment, we must respond with open minds, lest we

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miss creative opportunities or overlook threats.

The history of libraries can be viewed from many vantage points - one can focus on social movements, political influences, or economic fluctuations. Viewed through the eyes of a technologist, libraries have gone through a rising and falling pattern largely in response to changes in information technology.

So long as books were expensive artifacts, libraries were crucial to the preservation and transmission of knowledge. The reader had to come to the book. Surprisingly, the invention of the printing press was a mixed blessing for libraries. Since it cheapened books enormously, moveable type made it possible for readers to have private libraries and for books to be sold and bought as ordinary objects. Libraries in part lost their strategic place. This lasted so long as the number of writers, and especially of readers, remained modest. With the increase in writing for publication, particularly of things with lasting value such as science and philosophy, libraries became crucial again, more so because they organized knowledge than because they stored it. When the spread of literacy greatly increased the number of readers, popular libraries made it possible to share books too expensive for the masses to buy.

When the technology of printing and papermaking again improved, the cheap novel (later called a paperback) and the newspaper became accessible to a mass public, and libraries once again receded in relative importance. However, the growth of universities, research establishments, and government bureaus, both as users and as sources of material, more than compensated. Once again libraries came to the fore, organizing and storing knowledge.

Changes in the Workplace: The Computer in the Library

Soon after the end of World War II the computer entered our lives. At first computers were thought of as miraculous calculators, but it soon turned out that their capacity to store, process, and give access to data was if anything more important - certainly to libraries. Such activities, after all, form the core of their activity.

New technologies induce profound changes in the workplace. So far, the computer has primarily made changes in the way we as information managers do our work. Although systems such as those used for cataloging, circulation, and acquisitions have made our jobs easier and increased our productivity, they have not, for the most part, substantively changed what we do. We no longer type cards; the system supplies them. Patrons do not need to copy down call numbers before going to the shelves; the online catalog system prints them out. Patrons don't sign for books; a light pen reads their identification card and the system charges the book out to them. Automation has made things easier but not, as yet, fundamentally different. In fact, one of the most difficult issues one faces as a manager is encouraging staff to rethink a problem rather than replicate procedures in an automated form. As I shall argue, the challenge is as much inside us as outside; we need to lift our eyes to take in wider horizons.

With expanding access to electronic, machine-readable information through high-speed telecommunications links, and with the amount of material being "published" in electronic form increasing dramatically, libraries are faced with decisions that will change what they do as well as how they work. Take the decision of access versus acquisition. The issue is clearly posed with abstract and indexing services, which provide

their information both in printed and online versions. When should access to the online version replace acquisition of the print copy? Variables to be considered include costs, number of users, type of use, availability of terminals, and ease of direct patron use. We will soon face the access/acquisition choice with journals, government reports, technical manuals, specifications, and other highly current materials. The farther we get into accepting the principle of access over acquisition, the easier it will be to incorporate additional types of information as they become economically viable. The first steps will be the hardest. A hidden issue here is the fact that, to date, we measure and rank libraries by counting objects -- 2 million books, 30,000 journal subscriptions, 300,000 microforms. Questions related to content, relevance, physical condition, accessibility, service, and other hard-to-measure values are ignored. We must stop counting objects and develop new ways to evaluate our scope and worth.

Fortunately, given the increasing production of information, new forms of high-volume storage are also becoming available. Discs of several varieties -- analog, digital, and now compact -- are making it possible and reasonable to combine data from several media on one physical medium. Films, text, photographs, drawings, slides, as well as audio, can live side by side. The implications are particularly significant for storage of those materials we do decide to acquire rather than access remotely, and deeper thought must be given to the implications of new storage media for reorganizing the material. Currently one talks about putting "our entire slide collection" on a laser disc. One could more usefully say "we'll put our local history collection" on disc, a subject-based rather than a medium-based decision that potentially cuts

across a variety of forms and carries with it, in the new format, expanded opportunities for use and reuse. It rarely makes sense to restrict a search to a single medium such as slides; supplemental material is nearly always relevant. By grouping subject-based units of information, regardless of medium, we open new avenues of use.

Information Support Center: A Personal View

I would like to turn now to my image of the library, not as a museum or archive sitting out the print era, where collecting is an end in itself, but as an information support center. The simplest way to imagine the demands users may make, and the response of the information support system, is to describe the potential research and publishing process in the new age.

In the broadest terms, I as a researcher want to peruse literature and other types of information regardless of their geographic location, physical medium, or language form. I want to move electronically to the information and draw it out of databases, using my natural language and without particular attention to the logic of the system I am accessing. The perusing will be at a much deeper level than is currently available. I want to probe information at the chapter or the paragraph level and to look at specific tables, charts, illustrations, and other graphic and pictorial matter.

When I find useful material, I want, in word processing terms, to cut it out, move it over, and paste that information into my personal file. This cutting and moving is much the same process that is currently in use, except that today it's done with a razor blade and the information is removed from the journal or book permanently! In my version, full

citations to the source will automatically be brought along with each cut of my imaginary scissors, and of course the original source remains untouched.

If I am having difficulty finding what I need, I want both computer-based assistance and face-to-face contact with experts I will return to this topic below, but for now let me merely say that my work should be supplemented by system intervention or artificial intelligence at my choice -- I don't want an expert system second-guessing me at every step, but I do want to invoke it when I feel I need it. The matter of freedom of choice is very important; it allows for serendipity, happy accidents, chance associations, and similar creative glitches. Moreover, if my wanderings through the literature are too tightly channeled and controlled, I may well find the process highly unrewarding and spend my time calculating ways to circumvent it.

A simpler expectation I have is the ability to point to a word and ask for its meaning, having indicated my choice of dictionaries to the system. I will want to see, at the press of a button, the text of references cited in the work I am reading, and to go deeper into the references cited in second- and higher-level sources in the literature, engaging in an interactive form of citation analysis. Eventually, I may want to ask for an explanation of a topic or concept, perhaps indicating to the system what level of expertise I have in the subject area. For example, if I requested an explanation of black holes I would plead beginner's status, whereas I could claim expert status on thesaurus construction. The system must respond appropriately.

When I have gathered the needed information, I will build a file based on my personalized, idiosyncratic logic. I will index it in ways

meaningful to me and establish links between concepts that serve my individual needs.

In some cases, for example, if I am preparing an article for electronic publication, I may let the system format and code the text automatically to the specifications of the publisher. In other cases I can have the system format the material to my personal preferences or needs. The system will, in fact, store a variety of format programs.

The information I have created will be distributed via electronic "mailing lists" to colleagues with whom I wish to share it. In addition I may place the information in a publicly accessible file -- whether at the department or the institution level. As in any system, my message will be received, acknowledged, or ignored, and the process starts over. All this, of course, is done at my convenience, whether at two in the afternoon or three in the morning, at my pace, and from my choice of locations -- including my office at home.

To summarize, the information support system I envision is fast; it is indifferent to the location of information and to its form; it accesses a highly indexed and controlled body of information; and it is highly personalized. It serves as an information collection and manipulation system in support of my decisionmaking tasks.

Where Are the Pieces

How do we build such a system? Where do we get the pieces? Some already exist in computer centers and libraries. Consider the following characteristics of computer centers:

- 24-hour access
- unlimited and cost-effective storage

- o direct access to both local and remote data
- o easily manipulable files
- o high degree of technical expertise

Libraries complement those components with:

- o user-friendly orientation
- o highly structured files and collections
- o relative uniformity of access which generally obviates extensive user training
- o free access (within the confines of copyright)
- o high degree of subject expertise

In combination, these qualities form the core of the system I have just described. There are, however, missing pieces. Broadly speaking, at least five areas need considerable development work involving intense cooperation:

- o indexing
- o conversion of existing print materials to machine-readable form
- o access (hardware and software)
- o security
- o costs

Although these areas deserve to be discussed at length, I will refrain from such a discussion in favor of moving from the library to the profession of librarianship. I have already stated that the influence of technology has been in how we do our work but not in what we do. In other words, we have tended to think in terms of discrete changes in our work, requiring specific training perhaps but no rethinking of our functions or of our place in the larger knowledge system or information society. Yet if

we consider computers in a broader context, entirely new avenues open up.

When complemented by other technologies such as video discs, telecommunications support, and high resolution graphics, computers constitute an entity that can be labeled an "information machine". Just as automobiles have various options and come in a range of sizes and prices, so do information machines. Automobiles opened up previously unimagined opportunities and businesses, from drive-through restaurants to gas stations, but also hospital emergency rooms and motor-vehicle registration bureaus. Information machines are having similarly mixed effects. For librarians they open up rather breathtaking possibilities. For now at least, the mechanics of access, transmission, reproduction, and pricing are, in principle, solved. Our focus returns to the information itself - the message rather than the medium - if such a distinction is still possible.

One key to appreciating how important professional managers of information, you and I in fact, can be is right at the frontier, in the field of artificial intelligence (AI). Within this complex subject I intend to focus on what are called expert systems, on the special task of gathering and structuring knowledge for use with these powerful tools, and on the fit between our professional skills and this intermediary function.

A New Role

Thirty years ago, when computers were in their first generation, just moving into the semiconductor age but already deeply enmeshed in the world of science, some people at MIT and Stanford began exploring the possibility of using computers to do human-like activities -- to reason, to think, to be "intelligent". This work, and that of a handful of people

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to follow, was labeled artificial intelligence or AI. Some dismiss the phrase as an insurmountable contradiction; for others it offers a compelling challenge.

The change from data processing to artificial intelligence is a big one. It involves a transition from the simple capturing, magnifying and distributing arithmetic power, to a more complex stage of decision support activities which handle information, to yet a higher-level activity involving those same functions but focusing on the judgment process. The task is immeasurably complicated by two factors. First, we really do not understand how the human brain performs the functions of thinking, evaluating, judging. We know what goes in - information, both verbal and non-verbal, and experience. We also know what comes out. The mind, however, remains the ultimate black box. The second complication is the nature of knowledge in contrast to information. Knowledge is scarce whereas information is abundant; knowledge is perishable and disappears when an expert dies, yet while information's usefulness many flucuate it persists over time; knowledge is difficult to share or distribute whereas information is highly transportable and very compressible.

Artificial intelligence, then, deals with symbolic information in a heuristic way, rather than with mathematical data in a series of computations. One branch of AI which has experienced measurable, although not yet overwhelming, success is the development of expert systems. In basic terms, expert systems are computer programs that emulate the thought processes of experts as they solve a particular problem. The mental steps the expert goes through are reduced to a series of if/then rules, or inferences, which from the basis for a computer program or series of interactive programs.

There are actually two parts to an expert system - the so-called inference engine and the knowledge base. The inference engine is the aggregate of rules and logic statements the system uses as it sifts through information and formulates recommendations. The knowledge supplied to the system relevent to the problem being solved. Traffic moving along a highway system. In designing an expert system, the more these two components are kept separate the more flexible and expandable the system. For instance, it may be possible one day to unplug one knowledge base and plug in another while using the same inference engine.

Of the three methods -- rule base, frame base, and logic base systems -- used to represent the rules of a system and thereby construct the inference engine, one is particularly closely related to the way information scientists generally organize information, for example, when constructing thesauri. The frame base system constructs an environment or frame within which relationships between objects and their attributes operate. Relationships such as whole/part, cause/effect and genus/species are established. If one examines the vocabulary developed for the medical field, MESH, or the work being done to construct a hierarchic vocabulary for the fields of art and architecture, the AAT, one will see exactly such a frame based system. In addition to this overlap with the problems of classification in our field, another area of particular interest in this branch of AI is the method used in extracting from the expert his or her expertise or knowledge.

Edward Feigenbaum in his book Fifth Generation describes a common method.[2] The expert and the so-called knowledge engineer select a problem to be solved - one that is challenging but not overwhelming. There follow a series of meetings where the expert describes how he or she would

proceed to solve the problem. The knowledge engineer listens, asks questions, and draws conclusions.

What occurs in actuality is a reference interview - an elaborate, in-depth one, to be sure. The expert tries to express or make explicit what he or she does in solving a problem, but in fact makes leaps between concepts, uses imprecise language or jargon, says one thing while meaning another, omits key information, etc. All of this behavior is commonplace to a reference librarian, and the usual reference interview techniques of asking clarifying questions, rephrasing statements, offering examples, and applying a structure to the information being conveyed are used by the knowledge engineer to "make sense" out of the expert's formulation and to arrive at the truth in the statements being made.

The next step in creating an expert system is for the interviewer to systematize what he or she has learned into basic statements, values, or rules. This information then is conveyed to system programmers who must select from among a variety of programming techniques the method that best deals with the information. The next step, and a crucial one, is to provide the expert with a programmed version of what has been understood. Again in the library world, the reference librarian pulls material from the collection and shows the patron what she/he understands to be useful to the question being asked. The feedback provides both the librarian and the knowledge engineer with verification regarding their success in understanding and codifying the problem. In both settings iterations occur until a satisfactory system or answer is arrived at. In a short but forceful article in Datamation, September of 1983, Michael Koening pointed out that librarians, by their training, possess the skills of systems analysists.[3] He pointed to their ability to elicit information in the

reference interview, to organize information in retrieval systems, and to understand the technical aspects of computer systems, all of which are basic to systems analysis. I agree with Koening that the ability to do programming is secondary. Indeed, as we see programming languages become increasingly function-based, the need for extensive experience in writing programs declines.

Conversely, programming is quite complex in an area such as AI, with a variety of tools and techniques necessarily used in a single expert system application. I have previously argued that a division of labor is quite acceptable: "librarians should not become programmers nor programmers librarians."[4] Extending Koening's argument slightly, then, I see librarians not only as systems analysts but as knowledge engineers.

Feigenbaum and others have expressed concern that unless knowledge engineering itself can be reduced to an expert system, the process will grind to a halt by dint of its own complexity. I do not agree. Just as you cannot create an expert system where there are no experts, you should take advantage of a wealth of experts where they do exist. For centuries and in all technological contexts, librarians have elicited and structured information. To overlook them as a major resource in attempts to gather and structure knowledge for AI systems is irrational.

Feigenbaum identifies three scientific issues central to AI which underlie knowledge engineering. They are knowledge representation, knowledge utilization, and - most important - knowledge acquisition. While much additional work remains to be done in understanding how the mind learns, or acquires knowledge, I believe strongly that the library profession holds one key to the area of knowledge acquisition, by which,

in this context, is meant transferring knowledge from humans to machines.

Traditions

None of what I have argued implies that libraries, more or less as we have known them, will vanish. In fact, the element of continuity is apt to be stronger than we now suppose, first because our patrons will remain people and people change slowly. Secondly, the enormous store of material in those old-fashioned, but curiously convenient, random access devices we call books and journals will neither go away nor become quickly obsolete. While we probably could, we surely won't use lasers to read the contents of every old book, journal, and newspaper -- to say nothing of pamphlets, manuscripts, illustrations, charts and graphs -- into computer memories and storage devices.

Many of us will continue to function as we have, as guardians of traditional materials and guides to their use, serving also as bridges between the old and new. In this context one traditional area of librarianship in particular must undergo change.

One of the single biggest issues information handlers have struggled with in the last ten years is that of protection of copyright. Our current environment, with its proliferation of photocopy machines and personal computers, offers perfect opportunities for easy and, in the case of software, incredibly inexpensive ways to copy information. We can do little except make the public aware of the laws and hope they are followed. Software manufacturers, on the other hand, are studying ways to prevent unauthorized copying, ranging from physical deterrents to program obstacles. As we move farther toward the information support system, where less and less is acquired except by the process of access to

centralized files, the issue of copyright will become much easier to deal with since use will be tracked within the system. Several years ago I had thought that the issue would in fact go away, that a royalty would simply be charged as a routine part of access costs. I am no longer so sure. New information access techniques will break traditional bibliographic units down into fragments better suited to user needs. The information we retrieve from the system will not often fit the current boundaries: a journal article, a book chapter, a patent. Furthermore, information will be linked in such ways that traditional distinctions will be blurred -- especially when artificial intelligence is involved. I now fear that creators of information, ourselves included, will once again scramble to find new ways of receiving fair payment for work done without excluding users by high price barriers. Given the place of information-handling in our economy, developing a workable pricing system for intellectual property is of central importance.

Conclusion

To me the view from the chip is an exciting one. It encompasses a landscape of increased quality and quantity of professional work and enhanced opportunity for recognition and reward. For those of us who are willing and able to learn some new skills, supplementing those developed over centuries, new opportunities beckon. They will not, however, be handed us. As hospitable as the landscape may appear, it is in fact replete with obstacles. Individuals wanting to travel across it will require new skills as well as a new outlook, and will need the help of leaders who themselves may never cross the terrain. We need professional leaders who encourage and facilitate change by developing new

educational programs, adapting existing roles to renewed challenges, and creating a professional environment accepting of the new while valuing the old. We also need each one of us to open our minds and unbridle our imaginations.

1. Bok, Derek. "Looking into Education's High-tech Future". Harvard Magazine. (May-June 1985): 29-38.

2. Feigenbaum, Edward A. and Pamela McCorduck. The Fifth Generation, Artificial Intelligence and Japan's Computer Challenge to the World. Reading, Mass.: Addison-Wesley Publishing Company, 1983.

3. Koenig, Michael. "Librarians: The Untapped Resource". Datamation. (September 1983): 243-244.

4. Molholt, Pat. "On Converging Paths: The Computing Center and the Library". Journal of Academic Librarianship. (November 1985): 284-288.

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Adumbrations on the Information Support Centre

by

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ADUMBRATIONS ON THE INFORMATION SUPPORT CENTRE

Allan Horton
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When I was invited to be one of the respondents to Pat Molholt's paper on behalf of Asia I was uncharacteristically reticent, indicating that though I had some experience in looking at problems with my colleagues in South-east Asia it could be considered presumptuous for a librarian from one of the smallest nations in the area to be a spokesperson.

Further consideration of this leads me to the view that size or location is irrelevant and that what is needed is some fundamental thinking about the nature of the problem. The present forum is not a suitable context to undertake this work in detail and therefore like Molholt I must confine myself to a broad treatment of the problem. While the implications of the concept are manifold for those of us who are remote of the centres of publication, it is inevitable that the work currently being undertaken along similar lines to that which Molholt suggests will proceed. Perhaps I can begin to make my point by referring to "The Magic Pudding".

"The Magic Pudding" is an Australian children's story about a pudding which never runs out. Many people "cut and come again" to eat slices of this pudding but its size is not diminished. Furthermore it suits the taste of each. To one it is roast beef and Yorkshire pudding, to another the most delicately flavoured patè, to another satay and rice and so on, not neglecting the desserts. It is a menu of culinary

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delights. Such a wonderful pudding is owned by a small group of men and the story is concerned with the vicissitudes of the group and the pudding under the depredations of the pudding thieves.

I suggest that librarianship is such a pudding. It has the capacity to be what we wish it to be and it certainly has been assaulted by pudding thieves over the years. We can, however, watch what the pudding thieves are doing with their "ill-gotten gains" and, if we find this useful, add to our current menu.

Pat Molholt is clearly an innovative pudding cook. I have not thought it useful to comment on the originality of her recipe but it has a not unfamiliar taste to me as an academic librarian. The point is to determine whether it is a suitable diet to serve the clients in our libraries. In other words we should look in advance at how worthwhile the project is. I believe that this question must be answered by each type of library and must flow from an examination of the functions, the circumstances and the needs of its clientele.

In general terms librarians have the responsibility of providing wanted resource material which is needed by their clients. Increasingly this involves not only providing material from in-house resources but also tapping external sources. The format or source of the material sought and provided is a function of the means available to the user group either within the organization or externally, their experience, certain conventions and the funds available. Different groups have different needs and the librarian determines finally which of the material will be drawn to the client's attention. Academics will usually wish to see a wide range of source materials while practitioners may be content with "the answer"

Molholt proposes that we should examine our "traditional and non-traditional roles", draws conclusions from her evaluation, suggests that "there will need to be changes in our training programs and in the way we perceive the work and functions" and comments that there is nothing new about this for the profession has always reacted to changing technologies.

The "information support system" envisaged "...is fast; it is indifferent to the location of the information and to its form; it accesses a highly indexed and controlled body of information; and it is highly personalized. It serves as an information collection and manipulation system in support of..." the user's "...decision making tasks".

The proposal should be related to other responses to the changing technology such as that at Guelph and Columbia universities where territorially expansive librarians have subsumed the computer centre's function in the Scholarly Information Centre. I suspect, however, that Beckman and Batten will have a simpler job than Molholt, but may prove to have created other problems for their institutions in the long run. They have taken over existing operations which include responsibilities for the provision of certain data processing services not conventionally handled by the library with the intention of integrating the functions with those of their previous operations. They are thus dealing with two known quantities. There are other incompatibilities which worry me but at least both areas and their method of work are within their control and evolution can occur.

On my reading of the document, Molholt's proposal is that libraries should not seek to take over anything but rather to provide the necessary leadership using the present methodologies

of librarianship, computer science and the scholars. The intention is to facilitate access to the multiplicity of sources to which our users might wish to seek access and to make it easier to process the data received. At first glance this seems to me a wholly admirable concept but one which ultimately is so massive in its implications that it will take some carrying off.

The paper argues that we, the librarians, have special skills and insights not available to other professionals and these will complement the work being done on expert systems within the field of artificial intelligence. This is to say the least an assumption which can be argued. But within the concept of expert systems it assumes a more systematic and rational approach to our thinking about retrieval problems than has been evident in much of the output of librarianship during my professional lifetime (vide AACR2). We are to become knowledge engineers.

I would like to spend the remainder of the time available to me posing a number of questions, each of which could themselves probably provide the basis for a series of extensive seminars.

The questions are these:

(1) Is this worthwhile doing?

(2) Is it going to be done whatever we do?

(3) What "skills" are required and where do these reside?

(4) How big is the job?

(5) Has the problem been properly defined?

(6) Is a long term solution possible?

(7) What are the "commonalities" between the methodologies used in the scholarly disciplines, i.e. the sciences, the social sciences and the humanities?

(8) What are the dangers of not doing it?

(9) What are the legal and financial considerations?

Given the limited time at my disposal and the nature of the proposition to be discussed this will inevitably lead to a rather disjointed and unbalanced presentation. In those cases where a pithy comment is useful I will make it, otherwise you will be left with the question to answer for yourself.

(1) Is this worthwhile doing?

There are certainly great advantages for the scholar in being able to capture and manipulate data electronically without constraints of time or distance, format or system compatibilities. The elimination of unnecessary work will allow more productivity or more leisure, depending on the priorities of society, and thus be more efficient. The difficulties can be overcome by spending money and trends in the computer industry are more and more towards developing standardized formats for communication. It will take time and money but it is largely achievable. I believe this is Molholt's position also.

I have more difficulty when we get to the part of the job which involves expert systems rather than the development of a scholar's equivalent of The source. I am also concerned as to the degree to which these can accommodate all disciplines and classes of user. While I believe that any discipline will benefit from the application of the methodologies of those logicians interested in the development of expert systems, my present view is that certain disciplines are more amenable to them than others. These are those which have a controlled vocabulary and a defined body of knowledge which is generally processed using defined methodologies.

I believe that there is a good deal of perspiration in any

research project and it clearly would be beneficial to reduce this. I also accept that it would be beneficial to combine the efforts of a range of professions to attempt to develop a range of expert systems and the team would be incomplete without the librarian. I certainly would like to be able to search the primary and secondary sources for all references to a particular event or person. I suggest that while this would be very convenient it automates the most routine tasks and despite Molholt's comment to the contrary may very effectively eliminate the stimulation which serendipity can bring. I would also wish to search for concepts which while they are similar or identical may be expressed in different terms in different but relevant disciplines. Citation indexing is the only technique we currently have available to us to begin to do this.

I suggest that the cost of doing the job <u>retrospectively</u> is so immense that questions arise immediately as to the priorities to be allocated to it. I have commented elsewhere(1) on the increased use of electronic methods of recording data and suggested that given the reducing costs of storing such data, consideration should be given to retaining published material in this form.

<u>(2) Is it going to be done whatever we do?</u>

Yes, without question it is being done now to a limited extent by scholars, for the most part without the benefit of our participation. In many cases this results in wasteful use of resources through lack of standardization. There are, however, no "library industry" standards of which I am aware to which we could relate should we participate. Nor is much attention being given to observing the existing protocols (such as they are) for

inter-computer communication, which is quite disturbing. Perhaps this is one of the most urgent questions to be addressed now.

(3) What "skills" are required and where do these reside?

Here we have the most important question of all. Quite clearly scholars and researchers carry the necessary methodologies of their various disciplines and these can to some extent be generalized. The computer scientists, communication engineers and librarians are other essential contributors technically and conceptually speaking. It is not for me to comment other than on our role. It is our business to know how "information" is organized by its creators, to know where it is and how to retrieve it most effectively. Increasingly we are being asked to have a say in deciding how it should be organized. It is my view that the way information is organized should not reflect temporary fashions but relate to the functions it serves and thus groups of disciplines may require to use different techniques, cf. the method used by lawyers, chemists, physicists, etc. This suggests that user participation is essential.

(4) How big is the job?

The job is immense and thus requires that many people be involved. Yet there is an advantage in proceeding slowly on a variety of courses, preferably in association with schools of librarianship, information science and in the various disciplines. Such a considered approach is not yet evident.

(5) Has the problem been properly defined?

And the problem is yet to be defined for any discipline but I suspect that medicine and law will be the areas on which to concentrate initially, given developments in data handling for these fields. This is a topic which could challenge any post-

doctoral researcher and would preferably be dealt with by a team rather than a series of individuals.

(6) Is a long term solution possible?

Possibly not, and what is more it is a task that one expects will never be completed. Should it be possible to create such expert systems they would require constant refinement in a process of evolution which undoubtedly would lead to the melding of similarly organized disciplines. Inter-disciplinary approaches create a real challenge.

(7) What are the "commonalities between the methodologies used in the scholarly disciplines?

In those disciplines where similar vocabularies and methodologies are used it should be possible to devise methodologies for expert systems which will assist, but on my limited knowledge of such systems it would appear that many of the aspects of development will not only be discipline specific but event specific. This has implications for the cost of development.

(8) What are the dangers of not doing it?

Apart from the possibility that laymen are likely to set about re-inventing the wheel, I believe that the greatest danger of librarians not becoming involved in this work is that the needs of the "information poor" may be neglected. While I have no problem with serving the "information elite", and serving it well, the ethos of our profession and our social conscience must present the choice of options which are cost effective and therefore more accessible rather than those which are merely cheaper than the existing means.

While the proposal has a great attraction for librarians

remote from centres of publication technically many of the countries concerned have badly underfunded libraries which must be kept in mind in designing such systems.

(9) Legal and financial considerations

Finally I would like now to turn your minds to the legal and financial considerations of the proposition. Copyright has been identified as a question for attention in the original paper.

Given that it is only feasible to mount expert systems in an electronic medium, and assuming that fundamental honesty among those likely to have the resources to contemplate use of such expert systems, it would appear that fundamental changes will need to be made in our approach to free use of copyright material.

Already we have seen movements allowing the reproduction of material by libraries with systems being developed which have tended to continue the convention that the making of a single copy of part of a publication for research purposes carries no charge whilst multiple copying carries a charge. After all the alternative is to issue a copyright policeman with every publication. The increasing trend to the use of databases, and even more significantly the movement within this to electronic publication or storage of the contents of the publication, have led to the introduction of the licensing of the down-line loading of electronic data. This is undoubtedly a trend which will continue. As a result libraries will be involved in a cost which is intended not only to reimburse the data base generator for developing and mounting the system but also to cover the use of the data in the system.

It will be extremely difficult to maintain the tradition of free service from libraries when costs of provision can be directly related to the price per unit of service to the library

in the present climate where it appears that the overriding consideration is cost recovery. Librarians who regret the demise of the ideal of free library service must recognize that it will have to be defended and that it will be necessary to think more precisely about the questions involved.

As it is inevitable that electronic publication will grow, and equally inevitable that this will only be possible if the publishers must be reimbursed the profession should attempt to negotiate agreements for subscriptions for use rather than use by use charges. This will be more attractive to both parties in that it gives the publishers a guaranteed income and eliminates the need for the library to keep accounts. It also retains the present basis for obtaining publications. Joint action is probably essential if this aim is to be achieved.

Conclusion

Molholt's proposal is one to which we should attend as a profession. There has been sufficient experimentation now for library Associations to begin to act jointly to develop a logical context within which individuals can work.

(1) Horton, Allan. Electronic access to information. Interdisciplinary Science Reviews, 8(1) 1983, p.65.

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The Influence of information technologies on libraries and librarianship - ideas from another point of view

by

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1. Basing on the IFLA Core programs UBC and TDF it is necessary for the CSCE states to improve registration and documentation of national literature in national bibliographies.

2. Basing on the IFLA Core program UAP access to sources of information is to be improved systematically in the CSCE states. In this connection the mutual access to "grey literature" should be considered to a greater extent.

3. Basing on the IFLA Core program PAC in the CSCE states more attention should be paid to the preservation of records of the cultural heritage.

4. Compatibility of international and national library and information networks is to be ensured to promote a fast exchange of data and information in and between the CSCE states.

5. The libraries in the CSCE states stimulate reading and access to new media as a further form of access to culture.

I'd like to point to another international activity I suppose to be significant. In October 1985 experts of the three non-state organizations IFLA, ICA and FID met in Veldhoven/Netherlands. Subject of the seminar was the attempt to discuss the Core programs of these organizations and to exchange experiences between different occupational groups. The members of the working group III "STI, industrial information and business records" - a core program of FID - have decided to focus on one main topic, serving as an umbrella for a number of interlinking sub-projects. And the main topic is "Improving the information resources management system of an industry by coordination of the policies and operations of archive, library and information services". And one of the sub-projects is "A survey of organizational models for the functions of archive, library and information service within a sample of medium size and large industries". Some projects of the three working groups have been supported by other institutions such as Unesco. This enables to start an important stage in implementing information strategies for the year 2000.

In her paper Ms. Pat Molholt pointed out some trends into the 21st century. I begged to point out the vast importance of international cooperation and interdisciplinary work in this connection. For this reason the remarks on the CSCE and on common tasks of IFLA, ICA and FID. I'd like to formulate my ideas concerning Ms. Pat Molholt's paper as follows:

1. The demands for scientific-technological information, arising from the process of social reproduction and the new education and research in engineering disciplines, lead to highly increasing requirements on technical libraries. Integration of library and information work is becoming faster, cooperation between both is getting into new forms. Numerous working processes on international, national and regional level are rationalized and require new organizational forms. The introduction of new information and library methods into technical libraries - starting with establishing book stocks up to their usage - leads to changes in functional unit and distribution of work in supply of literature and information.

2. Though the printing media will remain the main media in technical libraries, new methods and techniques will cause changes in the sources of information and automatic systems of investigation of information. AV, video and other technologies set new questions to technical libraries and cooperation and distribution of work.

3. Cultural activity and, in particular, cultural heritage obtain a new status in technical libraries since qualitative changes in the demands of the people for literature and scientific information can be observed.

4. The higher quality of work required is in technical libraries at least possible by higher qualification exclusively. This means providing new knowledge, abilities and skills in the fields of planning, management and organization, electronical data processing, network theory, psychology and sociology, education, but also in business management. For

this purpose the preconditions have to be established to make use of these technologies to a great extent even in education and training, to supply sources of information fast and in high quality and to use automatic systems of investigation of information increasingly. The profession of the librarian is undergoing a fundamental change! And new occupational groups will enter the libraries.

5. Modern information techniques change not only the working results of the libraries, but also the habits of the user. Thus we have a "new" user in the libraries and must adapt ourselves to him. This requires new forms of user education as online user education for the catalogues and for access to data bases.

Certainly, all these aspects rise questions about the future of librarianship, in particular about its relation to other disciplines. There is a close relation between librarianship and other processes of exchange of scientific information, i. e. scientific communication. These relations are becoming closer, the integration is strengthening. If we consider science as a process of information, we have to exactly know the laws of scientific communication concerning the fast development of technology nowadays. Librarianship and information science as a part of a science of communication? Or both disciplines part of "informatics"?

III.

It is certainly enticing to follow the idea of an "Information Support Center". At the Freiberg Mining Academy we founded a Scientific Information Centre in 1970. It comprises all institutions of the Academy dealing with producing, acquisition, cataloguing, storing and making available of information. These were the academic library, the libraries of the institutes and departments, the facilities of documentation and information, the printery, the bookbindery, the educational film hire service as well as the academic archive. I regard it as a preliminary step towards an "Information Support Centre". The reason

of its foundation was to increase the potential of library and information according to rising requirements on education and research, i. e. a social purpose, a new content. Its continuation and thus steady adaption to new and higher requirements are legetimate and are continuously performed in the case of the Scientific Information Centre of the Mining Academy. For example, in 1983 the Centre became by order of the Minister of Culture "Central Special Library of Mining and Metallurgy of the GDR" and took over the management of a library network in this field for this country. The application of computers to numerous processes starting in 1985 and the stronger utilization of system of investigation of information abroad (VINITI Moscou, INFOterra, INSPEC and other) lead to further changes and expanding tasks. In particular the combination of the advantages of computer centres with the libraries - as Ms. Pat Molholt pointed out - is forward-looking and should be accepted.

IV.

However, I can not get to like the field of artificial intelligence. In my opinion, it is too early to speak about the influence of artificial intelligence on libraries and librarianship. Of course the application of each new generation of computers will face the libraries with new problems and allow reliable, fast and uncomplicated access to information. As Ms. Pat Molholt mentioned, artificial intelligence contains three scientific issues central to AI which underlie knowledge engineering: Knowledge representation, knowledge utilization, knowledge acquisition. But this is the great problem the libraries might not be supposed to solve in the near future. I'd rather like to stabilize computer technology used in libraries and to combine CAD/CAM with CIM and other facilities. I would like us to think about the application of holography to memory facilities.

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Cooperation between representatives of different occupational groups in construction and equipping of technical libraries in the 21st century

by

D. SCHMIDMAIER
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Special Libraries Division: Science and Technology Libraries Section

Cooperation between representatives of different occupational groups in construction and equipping of technical libraries in the 21st century

BR Dr. Dieter Schmidmaier
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Standing Committee, Member

"The reports of my death are greatly exaggerated"[1] replied Mark Twain when he found his name in the obituary columns of American news papers while he was in the best of health in London. Reports of the death of the libraries which appear again and again in the mass media of capitalist countries are similarly overstated. On the contrary: The subjects dealt with at the IFLA conferences in recent years and in particular the general subject of this years' conference leading us into the 21st century demonstrate the healthy state of the libraries. But the more complicated and comprehensive tasks of the coming century require new working methods and a higher level of cooperation and coordination. This also has consequences for the construction and equipment of libraries. Despite all tradition necessary, some trends turning out even today require new solutions.[2]

The changes which are in store for the libraries demand a closer cooperation between the occupational groups involved into construction and equipping of libraries. With technical libra-

ries serving as an example, some principles shall be presented for discussion based on the experience of the author gained in construction, evaluation and inspection of library buildings and resulting from trends in library and information science. Technical libraries seem to be predetermined to the author since

1. technological and technical innovations can be used faster and easier than in other types of libraries,
2. electronical data processing is a consistent part of the whole activity of the institutions, the heads of which are responsible for the libraries - such as company directors, rectors of technical universities, directors of research institutes,
3. links with information/documentation have reached a high standard.

I.

It is the task of a technical library to foster scientific communication. This has to be considered in construction and equipment of technical libraries by all who are involved.

Technical libraries offer the following common ground: [3]

1. the sources of information - technical libraries also have unconventional sources of information in addition to conventional ones (books and journals) which are often called "grey literature" and posess a high informative value (patent literature, standards, business literature, documents, reports)
2. the links with other scientific disciplines - technical libraries bear close relations to natural and social sciences, in particular to information science
3. the staff - technical libraries are characterized by specific qualification requirements of the staff, professional ethics and close cooperation with information/documentation

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4. the age - technical libraries are relatively new institutions, they were founded in close connection with the development of the means of production in capitalism during the 19th century
5. the size - technical libraries have only a relatively small book stock and staff
6. the legal position - technical libraries are often not fully open to the public
7. links with culture - technical libraries have a particular relation to culture, they do an extensive cultural-educational work.

"Communication, being the actual task of museum, finally decides the architectural organisation. The anatomy of the building is determined by the role the museum is to play in society, and by the emphasis placed upon the several aspects of communication."[4] This statement of Michael Brawne refers in particular to technical libraries. "Construction is a collective activity: carpenter, bricklayer and other specialists are engaged in building, as are community councilors, building contractors and architects. Everybody has his task in this process."[5] This is the opinion of the manager of a Dutch architect's office.

II.

In construction and equipping of technical libraries the following are involved

- architects, engineers, economists, construction workers
- experts of libraries and information/documentation
- heads of institutions technical libraries belong to
- users of libraries and information offices, often natural and technological scientists, economists or managers
- experts of various professions.

Each profession has its own task. But all professional groups involved have to cooperate since:

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1. there is the worthwhile objective of creating a building for scientific communication,
2. parameters have to be decided in the long run,
3. the level of investment has to be considered.

Opinions concerning cooperation are very different. For instance, in 1888 Charles Ammi Cutter had his doubts.[6]

Even in 1961 Georg Leyh and Gerhard Liebers mentioned the natural conflict between librarian and architect.[7] But recently the partnership has been supported more and more. Peter Günnel stands for the GDR: "In this sense the partnership between librarian and architect will be enlarged and involve the engineer. Regarding this fact, new demands will be made on the librarian"[8]. The Nigerian Abdulhali Mohammed commented: "effective communication is an essential ingredient for greater success and much more positive results"[9].

In the wide-ranging literature concerning this subject, the librarian - architect relationship is still too much restricted.[10] The following statement of Gerhard Liebers characterizes this situation: "The difficulties only arise from the fact that ideas regarding function often differ between designer and user. At least, misunderstanding is at play here which can be settled easily. In any case, it is necessary to take each other seriously and to establish a dialogue."[11] But this is not sufficient for the future.

III.

It becomes more and more complicated to build and to equip library buildings. Thus the tasks of preparing and implementing the construction become more and more complex. The reasons are as follows:

1. Changes with the sources of information, in particular the increasing importance of "grey literature", advance of electronic media and use of audiovisual teaching and training materials

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2. Changed growth of the libraries which is caused and characterized by miniaturizing some sources of information, increased importance of "grey literature", economic questions and stronger national and international coordination

3. Far-reaching changes in information behavior of the user in general and by means of technology in particular (AV work places, CAD/CAM and information, access to information systems)

4. Further advance of electronic data processing into working processes up to mechanization of individual work places

5. Growing importance of the subjective factor in general and ethic, psychological and social factors in particular

6. Changes in building industry, especially of economy, which turn out in library construction in the form of using preassembled elements, room separation according to operational conditions, furnishing and lighting

7. Optimal use of energy because libraries have a steadily rising energy demand - ranging from exterior and window design over an optimum design of the whole technical equipment up to lighting for events.

If we deal with the coming century at this general assembly, we have to know and consider these requirements[12] in time since they strongly influence construction and equipping of technical libraries. In the literature it is not stated as clearly as necessary that all participants have to reach an agreement about suitability, effectiveness and costs (also after the construction in running the library) and that both exaggeration and disregarding are harmful.

IV.

Architects, engineers, economists and construction workers as well as the heads of institutions technical libraries belong to (here called professional group A) have to fulfil all functional, constructive, formal and economic requirements of the library building. They have to take into consideration that the

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building has not only a technical, but also a social aspect. Summing up these tasks, the importance of the professional group A in the construction process can clearly be seen. Simultaneously it shows the dependence of this group on an intact relation to the principal: Insufficient cooperation means dangerous isolation which in turn results in an unsatisfactory, inadequate solution.

Experts of libraries and offices of information/documentation (occupational group B) represent in construction and equipping technical libraries a special group of people which will work in the new building (the term "user" used in general is ambigous): the staff of the library on the one hand and the readers of the library on the other. Their objective is a technical library working in an optimum manner. To this end the occupational group B is forced to cooperate with the group A.

Each occupational group has to accept certain preconditions and to take on some duties before the actual cooperation can start. This is to be shown in the following examples:

1. Group A has to be willing and able to understand all the wishes of the principal in the right way, to be aware of all demands of the principal including those regarding urban development and to work out optimum programmes and detailed construction plans. - Group B has to determine functions and tasks of the new building in detail. They have to take into account that the higher requirements of the 21st century must be reflected in the plans in good time since planning in this field covers longer periods. Group B must have an exact idea of the plans of group A and be able to implement these plans according to necessities and possibilities of librarianship. Moreover, they have to render a contribution to discussion and design.
2. Group A has to put the desires of group B into practice according to function and aesthetics, i. e. to involve the functional demands and to create a building harmonizing as a whole (interior as well as exterior). - Group B has to be

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interested in architecture, building industry, technology and economy and to gain basic knowledge of these fields.[12a] They should be open-minded partners regarding all questions concerning the future building.

3. Group A has to work out a low-cost variant which also fully guarantees the working order of the building. In doing so, it is not the investment costs but the operating costs which are the most important factor.

The solution of these and many other tasks require the occupational groups A and B to be aware of their responsibility, to have a great ability in their fields and a positive attitude to their jobs, i. e. professional ethics.

V.

The Swiss architects Pfister Brothers understand the framework of cooperation as follows: "First of all there are the people which are to be involved with the happenings with their sensitivity, phantasy, patience and persistence, modesty, clear sense and power of imagination, their decisiveness and strong will for positive cooperation, their strength to commit themselves to a cause... Secondly there is the constructional task including the programme to be elaborated with extension possibilities, building site, which has to be found or, if already found, to be analysed regarding to suitability, including also existing buildings which have to be tested for enclosing... Third there are the financial means available which are closely related to the constructional task..."[13] According to J. H. C. G. Calis in this process the librarian is converted from "information giver into creative, thinking examiner of the resultant alternatives, determiner and controler of initial situations. The architect is transformed from information receiver into information processor, developer of patterns, designer, constructional preparer and companion", construction controler up to (again) giver of information regarding costs and quality.[14]

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This requires a great deal in common:

1. Cooperation starts with the fact that both construction and equipping of a technical library need a design for a long period. There is no other building which requires similarly detailed ideas for 20 years and more (in contrast to theatres, cinemas and hospitals, a technical library is steadily "growing").
2. A technical library is a mixture of office building + public building + storehouse + cultural facility. Thus, construction and equipping are difficult.
3. With the opening of the library the construction process is completed for the architect, but the librarian at this moment faces the problem of transposing the ideas set up in common work into the actual areal situation, and the economist "feels" the operational costs.
4. It is necessary to learn and to understand the professional jargon of the other, but also to be aware of the fact that it is not always possible to understand each other.
5. Efforts for close cooperation can be hindered by bodies formed during preparation and construction (e. g. for evaluation). For this very reason all occupational groups have to be closely related from the very beginning and must defend their common ideas.

The cooperation is performed in several stages and by means of different documented plans:

1. The constructional programme or documentation: A profound elaboration of the programme is necessary since construction cannot begin without these documents concerning content and legal requirements. The programme contains
   - the description of the tasks, the area of activity and the function of the technical library, from which the necessity of the construction can clearly be seen
   - the areal demand with the aim of setting up a detailed programme
   - the individual sections

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- all functional relations in the building as well as communication links between the staff and the users among themselves
- the equipment of the building.

2. Aids in decision-making: Scientific organisation of work, electronic data processing and layout of the desired new building turn out to be very worthwhile in decision-making.

3. Common activities: Courses of further education in bodies of the international libraries associations or international organisations considering the interests of technical libraries (IFLA, IATUL, LIBER), but also common dissertations, thesis and publications are of great importance. This makes the cooperation much easier and strengthens the team spirit.

4. After completing the building: The director of the library of the Technical University Miskolc/Hungary commented about this strikingly: "Here some ideas have to be stated about the fact that after inauguration of the building a further good cooperation with the architects is retained. Some years later various demands can emerge and smaller corrections and remodelling become necessary. In a pleasant, modern building only a skilful hand can be allowed to do a brushstroke. The library's director should prevent the building from steady rebuilding, such as transposition of doors and walls. The success of the library depends on conscientious and disciplined work, not on moving walls."[15]

In order to reduce differences of opinions the reasons of these have to be known. These might be as follows:

1. Within the theme "Respect to the other": For the entire process of preparation and construction of a library it is harmful if underestimation and mistrust disturb the common task.

2. Within the theme "Function - urban development": Questions of fitting-in the library building and obligations of defined heights and depths, even constraint to a defined design are fundamental questions, which often are estimated by both occupational groups in a very different manner. If harmony

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of form and content as regards urban development cannot be reached, a new place has to be chosen. This aspect also refers to smaller technical libraries, in particular if the area of the library is involved into existing obligations.

3. Within the theme "Function - facade": Here the opinions can differ to a great extent. In exaggerated form, the librarian can demand "building from inside to outside", but the architect on the contrary "building from outside to inside". The building of a technical library must not be a magnificent building, but must be more than solely functional building. It should be effective and meet interior and exterior aesthetic requirements. A technical library is a public building just as much as a school, city hall or hospital.

4. Within the theme "Correctness of functional processes or crossing the ways": The librarian wants to put the ideal "reader - librarian - information sources" without crossroads into action. But the architect can hardly implement this ideal. He naturall asks the question whether, or not real ideas can be formulated based on the ideal. "If in a hospital stretchers with patients can be wheeled along the floors passing by the visitors, it should not cause a disturvance if in a library, librarians wheeling book carriages (or not) can meet library users or come some of the way with them."[16] That's right.

5. Within the theme "Technology and economy": The high economic expenditure and the increasing mechanization in construction and equipment of technical libraries can easily lead to differences and quarrels. To refuse computers due to their expense is as damgerous as if they are permitted without conclusive reason and full utilization planned. For instance, a simple permission of lighting of a special amount in rooms open to the public without differenciating is unreasonable. Similarly discussions about economizing concerning only this field are foolish.

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VI.

In all our considerations we should never forget the reader who is the actual central figure of a new library building.[17] It has repeatedly been mentioned that the reader is to be asked - or rather "consulted" - as well. He finally accepts or refuses the new solution offered to him. There are critical voices which should be considered:

- The privacy or intimacy often is lost in a modern building due to large connected rooms
- Lighting is impersonal
- New catalogue forms of the online-system seem to be too difficult.

VII.

In the 21st century technical libraries will gain further importance. They will become larger and will supply more and more users with information sources. The boundary to information offices will be fluid. Scientific information centres, libraries in research institutions and enterprises will represent a great scientific-technical potential. These new contents and structures, in particular the influence of modern technology on working habits and results and the close cooperation between library - information - audovision - polygraphy - bookbinding - reproduction, will influence the construction of technical libraries (or will they already be buildings of Scientific information centres?). New buildings of technical libraries and technical libraries in old, but reconstructed buildings will be equal in form and possibilities.

Without cooperation between the occupational groups A and B technical libraries working in an optimal manner are not planned nor built nor run! For this very reason, the barriers to fortunate cooperation in construction and equipping of technical libraries - these are psychological, organisational and technical ones[18] - have to be overcome as soon as possible.

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"The library construction, which is in any case very costly and becomes necessary as new building or building extension only in long-term intervals in the history of each library, requires an overall determination of its function in presence and future. In this respect, library construction gains great importance and becomes a fundamental question of library science since it is closely connected with the perspective of each library and the national librarianship the library belongs to."[19]

Reference

1 "The reports of my death are greatly exaggerated" (A cable from Europe to the Associated Press). - In: Familiar quotations: a collection of passages... / traced by J. Bartlett. - 11th ed. - Boston, 1951. - p. 616

2 Kroller, Fr.: Bibliotheksbau und Bibliothekseinrichtung im kommenden Jahrzehnt. - In: ABI-Technik 3(1983)3. - p. 195 - 200.

3 Schmidmaier, D.: Fachbibliotheken im Bibliotheksverband der DDR am Beispiel technischer Bibliotheken. - In: Zentralbl. Bibl. Wesen 95(1981)7. - p. 318 - 321.

4 Brawne, M.: Neue Museen : Planung und Einrichtung. - Stuttgart, 1965. - p. 19 - 20.

5 Calis, J. H. C. G.: Architekt und Bibliothekar. - In: Buch und Bibliothek 31(1979)1. - p. 52.

6 In: Library journal 13(1888)Nov. - p. 318.

7 In: Handbuch der Bibliothekswissenschaft. - 2nd ed. - vol. 2. - Wiesbaden, 1961. - p. 944.

8 In: Ein Wegbereiter sozialistischer Bibliotheksarbeit : Erich Schröter zum 70. Geburtstag. - Berlin, 1964. - p. 169.

9 In: Pakistan Library Bulletin 12(1981)3-4. - p. 18.

10 The following stand for the great variety:
Fielding, D.: The librarian and architect relationship / D. Fielding ; R. Gibson. - In: Proc. 19th conference Library Association of Australia / Ed. A. Batt. - Hobert, 1977. - p. 107 - 118.

Günnel, P.: Bibliothekar und Architekt : ein Versuch. - In: Ein Wegbereiter sozialistischer Bibliotheksarbeit: Erich Schröter zum 70. Geburtstag. - Berlin, 1964. - p. 165 - 169.

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Korrekturen nicht bzw. zeilenweise auf besonderes Blatt schreiben

Liebers, G.: Bibliotheksbau heute - aus der Sicht des Bibliothekars. - In: Bibliotheksbau heute. - Frankfurt a. M. - p. 45 - 60. - (Zs. für Bibl. wesen u. Bibliogr. ; Sonderh. ; 33)

Lewis, M. E.: How to work with an architect / M. E. Lewis ; M. L. Nelson. - In: Wilson libr. bull. 57(1982)1. - p. 44 - 46.

Mercer, A. E.: Librarian and architect : the case for cooperation. - In: New Zealand libraries 28(1965)11. - p. 273 - 279.

Pfister: Der Architekt und die Bibliothek. - In: Nachrichten Vereinigung Schweiz. Bibliothekare 37(1961). - p. 97 - 111.

Schlitt, G.: Bibliothekar und Architekt als Partner beim Bibliotheksbau. - Köln, 1967. - 86, XVIII p. - Hausarbeit, Bibliothekarlehrinstitut Köln, 1967.

Thomsen, C.: The architect and the librarian. - In: Unesco bull. libr. 16(1962). - p. 146 - 151.

Törnudd, E.: Interaction between the librarian and the planners and builders : what can we learn from mistakes? - In: Nordisk tidskr. för bok-och biblioteksv. 62/63(1975-76)2. - p. 55 - 57.

11 Liebers, G.: Bibliotheksbau heute - aus der Sicht des Bibliothekars. - p. 50.

12 I refer to documents and papers of UNESCO, IFLA and IATUL predominantly as well as to the following contributions:

Bonitz, M.: Wissenschaftliche Kommunikation - heute und morgen. - In: Forschungstechnologie. - Berlin, 1983. - p. 154 - 171. - (Beiträge zur Forschungstechnologie ; 9)

The future of books. - Part 1 - 3. - Paris, 1982 - 1984. - (Studies on books and reading ; 8, 9, 18)

World congress on books London 1982 : Final report. - Paris, 1982. - 60 p.

Non-convential literature. - In: Aslib Proc. 34(1982)11/12. - p. 457 - 505.

Kartaschow, N. S. - Moscow, 1983. - 24 p. - (IFLA General Conference Munich 1983 ; 48 - PLE - 5 - G)

Line, M. B.: Is cooperation a good thing? - In: Library cooperation: Trends, possibilities and conditions / Proceedings of the 8th meeting of the IATUL. - Göteborg, 1980. - p. 5 - 12.

Jones, L. C.: The impact of technology on users of academic and research libraries. - In: IFLA Journal 10(1984)1. - p. 49 - 56.

Evans, G. E.: Teaching new technologies : whose role is it? - In: IFLA Journal 10(1984)2. - p. 151 - 157.

Kroller, F.: Standards for library building. - In: INSPEL 16(1982)1. - p. 40 - 44.

KO 8 2/77/6/77
gerade Seitenzahlen

0378

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Korrekturen wort- bzw. zeilenweise
auf besonderes Blatt schreiben

Ruddigkeit, W.: Bibliotheksbau in den 80er Jahren. - In: ABI-Technik 3(1983)1. - p. 1 - 5.

Schwarz, G.: Einige ökonomische Fragen des Baus und Betriebs von Bibliotheken. - In: Zentralbl. Bibl. Wesen 98 (1984)4. - p. 145 - 152.

Kroller, F.: Energy conservation in library buildings. - In: LIBER bull. 16(1981). - p. 46 - 48.

12a Marilyn Hawkins said this very simply "Take the time to learn a little jargon. Quick." Hawkins, M.: Adozen ways to make your architect love you. - In: Technicalities 3(1983) 3. - p. 5.

13 Pfister: Der Architekt und die Bibliothek. - p. 97 - 98.

14 Calis, J. H. C. G.: Architekt und Bibliothekar. - p. 52 - 53.

15 Zsidai, J.: Nach dem Bibliotheksbau... - In: Arbeiten aus den Bibliotheken der Bergakademie Freiberg/DDR und der Technischen Universität Miskolc/VR Ungarn. - vol. 1. - Freiberg, 1976. - p. 12. - (Veröffentlichungen des Wissenschaftlichen Informationszentrums der Bergakademie Freiberg ; 69)

16 Bauhuis, W.: Alte und neue Ideen im Bibliotheksbau. - In: In libro humanitas: Festschrift für Wilhelm Hoffmann zum sechzigsten Geburtstag 21. April 1961. - Stuttgart, 1962. - p. 74.

17 Fabian, B.: On reading in modern libraries. - In: LIBER bulletin 16(1981). - p. 10 - 15.

18 Törnudd, E.: Interaction between the librarian and the planners and builders. - p. 55 - 56.

19 Kunze, H.: Überlegungen zum Thema "Bibliotheksverwaltungslehre". - In: Zentralbl. Bibl. Wesen 77(1963)12. - p. 555.

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Division: Special Libraries

Section: Science and Technology Libraries

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THE UNITED NATIONS UNIVERSITY PROPOSAL FOR AN ARCHIVE OF TRADITIONAL KNOWLEDGE:

Implications for Scientific Communities

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includes the basic aspects of human needs such as concepts of housing and habitat, medicine, food and environmental management, aspects which have a direct relationship with the attempt to use a comprehension of the environment for survival. These concepts are not merely subjects of academic interest. They often form the very essence of the fabric of the entire society and provide the meaning and purpose of the entire human value system within the historical, geographical and ecological context of the society's world view.

The pre-industrial knowledge base of traditional societies can relate not only to modern science and technology but also to the current efforts to establish a viable human habitat in an inter-dependent environment, and also to social norms and forms of social control. Components or concepts that are part of such traditional knowledge might not only provide a deeper understanding of the societies which produced such knowledge but could also inspire new concepts for the betterment of, especially, inter-personal relationships. Thus, on the one hand the awareness of such knowledge could enhance the possibilities of a more effective and humane process for the transfer of science and technology, and on the other hand some concepts may help to make life more meaningful, especially in a post-industrial society. There is much to learn from the experience of peoples in the areas of, for example, conflict resolution, the work-leisure dichotomy, the maintenance of the human body, and the multiple use of space.

The individual inventors, originators and conceivers of such knowledge are rarely known since it usually represents an accumulaton of contributions from many persons over many generations. Written records of traditional knowledge even when available rarely trace its development and contributors. The knowledge generally appears as finished and perfected concepts or products as currently applied by the society.

To cite an example, the principles and concepts of Balinese architecture were largely written and explained on lontar or books of bamboo, which have been used as the main reference for any Balinese wishing to construct traditional buildings and compounds. Unfortunately, most Balinese no longer are able to read the old Balinese language in which the knowledge has been recorded. Only the knowledgeable masters, of whom there are only a few, know the principles and concepts of the traditional Balinese habitat.

Another example, that of the jamu or traditional Javanese medicine, is even more typical. This knowledge was not originally written down but was conveyed orally among the population through the dukun or traditional medicine man. Recently, however, a family in the Solo region of Central Java has managed to commercialize the traditional Javanese medicine through modern methods of trade. By packaging the powdered medicine and distributing it through market outlets throughout Indonesia and even abroad, the family has established a business

empire with modern factories and laboratories.

The traditional knowledge of some societies has been developed around a desire to view the presence and equilibrium of the society and its individuals in the environment as a natural process. Thus, in such societies, the concepts as they developed were integrated with their belief and value systems. Thus, traditional knowledge grows with the society and within its social inter-relationships. Traditional knowledge has its own thought system, repetitive pattern and predictive element, as well as channels of dissemination. The traditional channels of communication include all the cultural infra-structure within the society, including the arts, games, and value systems. The explanation, articulation and socialization of knowledge as an accepted system is achieved through such traditional channels of communication. Thus, in Java and Bali the explanation and articulation of concepts on the management of the environment is done through the wayang-kulit (shadow puppet play) performances and other folk productions. Through such methods, traditional knowledge was nurtured in the society and its value accepted until other socio-cultural forms from outside or from within the society began a process of destruction or interruption of the continuity of tradition. This often led to the degeneration or the abandonment of many precious traditions which could have been an asset to other societies elsewhere in the world. For precisely these reasons the organization of an Archive of Traditional Knowledge at the Headquarters of the United Nations University assumes an important significance.

II. Purpose

There is a growing recognition that the traditional knowledge that has been accumulated through generations of experience is of great and irreplaceable value, and of increasing relevance to modern society. One has only to look at the current wave of interest in medicinal plants to see the potential value that traditional knowledge can have for modern industrialized societies. Traditional knowledge exists to a certain degree in every culture and society. It is basically the kind of knowledge that is not subject to patent and copyright regulations. Having served its possessors for many centuries in many aspects of their lives, traditional knowledge is of great value today as more is learned about the benefits and uses to which it can be put in a wide variety of areas. Traditional knowledge is being examined as a source of stimulating ideas, and as alternate approaches to many fields of current scientific inquiry including herbal medicine, faith healing, linguistics, birth control, social organization, information processing, knowledge transmission, conflict resolution, water purification, food preservation, agricultural practices, housing construction and settlement plans.

The wealth of traditional knowledge that is still available is not unlike the wealth of genetic material which exists in our

environment, and its preservation can be considered of similar significance to the future of humanity. This knowledge, which may be technical, social, organizational, or cultural, was obtained as part of the great human experiment of survival and development. It is part of the common human heritage. It is, therefore, in the interest of humanity to preserve as much as possible of this heritage so that in can be applied directly, as well as use it as a source of comparison and stimulation through the cross-fertilization of ideas, in the search for solutions to the problems that are now being encountered at an increasing rate.

Modern science and technology have changed the concept of life and the perception of organizing life into a more complex and intricate inter-relationship of various cultural elements. While modern science and technology have managed to transform many life-styles into more uniform and productive ones, they are also unfortunately responsible for the reduction of many valuable and cherished elements of the cultures of numerous societies to a superficial level.

Traditional knowledge, which is an important part of cultures, is being gradually overshadowed, replaced and sometimes brushed aside by the introduction of life-styles dominated by modern science and technology. In the context of a hectic process of modernization of economic, social and cultural life-styles, their usefulness and relevance for the societies at particular stages have faded away and have become obsolete in the face of the adoption of new life-styles ushered in by modern science and technology, and their principal promoters and manipulators, trade and industry. The accumulated knowledge has been added to and enriched by generations of village elders, medicine men, alchemists, builders, artisans, court literati, astronomers and others, and has been maintained in a fine balance with the social structure and value systems. But now it is being increasingly rejected in favour of modern ways of life and considered irrelevant to the present social perception of life.

Traditional knowledge is a record of human achievement in comprehending the complexities of life and survival in often unfriendly environments. In the past, traditional knowledge has been retained, retold and applied by many persons, but due to its decreasing use in contemporary societies, the number of experts and supporters of such knowledge is dwindling. Thus, this knowledge is threatened with disappearance from human memory without ever having been written down as the people who remember and apply it die. There appears to be a growing concern about the disappearance of much traditional knowledge in many parts of the world, particularly among those who have become aware that traditional knowledge may not be irrelevant to modern life after all.

Much of human progress has been based on the foundations of the knowledge acquired and developed by earlier traditions. While the earlier traditions are in some cases surpassed, they

are not altogether useless. Often the earlier knowledge is still valid under a set of circumstances that previously prevailed and would again be valuable where and when these circumstances are encountered in the future. /Some superceded knowledge may no longer be applicable but a record of it can provide valuable lessons concerning the process of knowledge development. And although it may have been superceded in its original area of application, that is no guarantee that its basic concepts might not be useful in the development of knowledge in totally different areas.

Therefore, it is important that this information be gathered, organized, developed and synthesized for application in the contemporary world. The new developing nation-states of the Third World are in many respects in a more fortunate position than the more industrially advanced nations in this regard. Their recent emergence as nation-states from traditional societies places them in closer temporal proximity to this knowledge which could be used advantageously in their search for a new and richer national identity.

Several leading institutions have been systematically gathering information, at least some of which constitutes traditional knowledge. But these institutions, as national activities, are only a beginning. What is needed is a concerted and co-ordinated effort to establish in a central place a global Archive of Traditional Knowledge. Such an Archive would attempt to organize and provide access to all the traditional knowledge that could be assembled in one place for use by institutions and individuals desiring information on any aspect of the traditional knowledge of any particular culture or nation from anywhere in the world, past or present. This Archive should be not only in a position to map the geography and the history of traditional knowledge, but also help maintain and foster confidence in the value of this pre-modern knowledge. The emphasis of the Archive is not based on nostalgic motives to preserve the past, but on pragmatic and functional desires to preserve inherited human wisdom for the enrichment of present and future humanity. With these goals in mind the United Nations University Council at its Nineteenth and Twenty-First Sessions approved funds to explore the feasibility of establishing an Archive of Traditional Knowledge.

III. An Important Asset for the UNU

The establishment of an archive devoted to traditional knowledge will contribute to increasing the visibility of the UNU in Tokyo in view of the current development of similar libraries on very specific topics in Cambridge (UK), New Haven, Rome, Paris, Geneva, Mexico City, Washington DC, and elsewhere. The UNU Archive of Traditional Knowledge will be unique in its efforts to collect, classify and store for retrieval as much of pre-modern material as can be assembled from all parts of the world in a single place, while emphasizing and encouraging the importance of maintaining and preserving such knowledge by the

originating societies. This will eliminate the need for interested scholars to make many visits to different institutions in various parts of the world, since all the information will be available in one place at the proposed Archive at UNU headquarters in Tokyo. In addition, this multi-disciplinary research Archive would continue to provide valuable sources of ideas and materials for the development of most of the UNU projects and programme activities, and introduce a historical perspective to much of its work. As an important tool for an institution combining international and intellectual characters, it will stand as a clear expression of UNU's sincere interest in all peoples of the world and the contributions they have made to the global fund of knowledge that is the heritage of all humanity.

It is also expected that the research Archive will become the major meeting place for those scholars interested in understanding the historic process of development through the study of traditional knowledge. The existence in Japan of a huge mass of pre-modern knowledge that still remains an active part of the culture, and is highly respected and carefully preserved, makes Tokyo an extremely advantageous and exemplary location for the kind of activities envisaged to accompany the establishment of the Archive. Few other societies provide as good an example of a harmonious development of relations between traditional skills and modern technology.

With regard to its value to UNU programmes, the Archive will relate directly to previous and on-going UNU activities in such areas as rural energy systems, food preservaion technologies sharing of traditional technology, and the investigations into endogenous creativity. It will serve as a repository for the knowledge collected with the help of all UNU networks. It will use academic as well as non-academic sources. The Archive will co-operate with other organizations within the UN system which have shown concern for the collection of traditional knowledge in their areas of responsibility, such as UNESCO, FAO and WHO, as well as many scholarly institutions around the world.

By using all available material, from written documents to modern electronic recordings, the Archive will be a unique storage, classification and retrieval facility. The Archive could could be housed in the new UNU headquarters building. There it would not only serve the purpose of attracting scholars to the UNU but will be designed, organized and made accessible, through exhibitions, and screenings, to the general public, thereby providing a new cultural, as well as scientific, landmark in Tokyo.

The establishment of such an Archive represents a difficult and complex task. The methodology to be adopted and the process by which it can be established will benefit from a wide range of inputs and consultations, involving individuals and institutions, from all parts of the world, as well as international scientific organizations and interested UN agencies.

IV. Organization of the Archive

The Archive will be a systematic and organized collection of all types of material available on traditional knowledge, from written documents to modern electronic recordings. It will be initiated and organized as an integral part of the United Nations University as a major project. However, in doing this the UNU will be counting on support and co-operation from many sources, institutions, foundations, universities, museums, libraries, UN agencies, and persons interested in traditional knowledge and its preservation. Institutions such as museums, libraries and universities, and persons who have been for some time actively engaged in the acquisition of traditional knowledge will be contacted and encouraged to contribute relevant material in their possession to the Archive.

The Archive would will organized centrally and located under one roof. The project will be under the supervision of the Global Learning Division and will, when established, have a director and assisting administrative and professional staff.

The UNU will encourage countries to establish their own archives of traditional knowledge and may be able to assist countries in finding sources of funding and expertise for these national archive projects. The UNU Archive then will provide assistance and guidance to the further development of the national archives. In this way, every country so desiring can have its own national archive, in addition to having access to a central UNU Archive for comparison and expansion. Thus the UNU Archive will have foster a network of national archives in many countries around the world to fall back and draw on for resources or specific knowledge whenever needed.

V. Methodology of Collection

As stated, traditional knowledge appears as finished and complete objects, processes or concepts. But, not all of the finished concepts are explained systematically in such forms as written documents. Therefore, the process of collecting materials for the Archive will consist of collecting material which appears in both written (manuscripts and books) and unwritten forms.

The first process would involve "manuscript hunting" in areas or regions that obviously possess suitable material. Local book-shops, especially second-hand book stores, and local libraries will be intensively searched. But in many countries, such material is not often published and sold in bookstores or catalogued innlocal libraries. Much material is handwritten and often the private property of individual families. There is no better methodology to identify these manuscripts than by locating them through personal contacts. Patience and diligence are certainly important assets in the search. After the manuscript

has been located, the next job would be to persuade the owner of the manuscript to lend it for photocopying or micro-filming. This will require diplomatic skill since frequently manuscripts are considered as sacred family heir-looms and not permitted to leave the house.

Since most of the knowledge and skill in traditional societies are transmitted orally and not through written literature, the second process is a much more important and difficult one. It requires people with skills and training and a good knowledge of the societies involved. The researchers will have to know the local language and the cultural background. Since outsiders rarely have this skill, it is important to work with knowledgeable people from within the local communities. They could be local researchers and academicians, but most of the time they would be required to work with local people including chiefs, headmen, shamans, priests, spirit mediums, village elders and craftsmen. This will require patience, care, sensitivity, and long-term involvement. Actual meaningful knowledge may not necessarily be learnt from educated local elites. They may be articulate but may not have respect or confidence in the traditional knowledge, as is usually the case with many local elites educated in Western value systems. Therefore care must be taken to identify the people who possess traditional knowledge and record directly from them to supplement the descriptive and interpretative records which will be given by the local elites.

A spin-off project would involve trying to expose the traditional craftsmen of talent to different and improved ways of doing the same thing in societies other than their own. This will be a unique programme that might result in a breakthrough in the process of development in many countries around the world. This will certainly help the craftsmen of the developing countries and could act as a catalyst in the process of development. It has been a common practice everywhere to bring in university graduates and eduated leaders for further training, to attend seminars or orientation programmes. This type of programme has certainly helped the further education of the educated and westernized elites of the developing countries. But it is doubtful whether this will ever reach the level of the craftsmen or the people who are knowledgeable but are without modern western education. There are not many examples outside of China during Cultural Revolution where the university-level education process was brought to the level of common and shared participaion with the "uneducated" craftsmen and peasants. The UNU does not even have any models for this, and it is unlikely that any other institution, national or international, will ever try this approach. Therefore it will be a worthy experiment to try to help the holders of traditional knowledge themselves in addition to preserving their knowledge, which it is hoped will then be utilized somehow. This is an example of the kind of project that can be generated around the Archive.

The Archive will also collect relevant photographs, film and video recordings of the topics covered studied through oral and

written forms. This supplement and illustrate the information recorded in texts with much clearer and greater impact. Photographers and video camera operators, therefore, will also have to accompany many research field teams. In doing this, the focus will be on the collection of information of the actual processes of applying and transforming knowledge and skills, and the way they are effected in that particular society. In the case of a shaman or a faith healer, the entire process of communication between the healer and the patient would be a very important subject to record both by writing and filming the actual procedure of treatment as well as the local environment. In the process of faith healing, like modern psychiatric treatment, mutual confidence and trust and a special unspoken language of communication between the professional and the patient are very important. In this case, descriptive writing would be academically interesting but not helpful for replication if the body movements, facial expressions and the methods of communication between them are not recorded.

Most of the countries that are rich in traditional technology, which is still functional, happen to belong to the Third World. The Archive could conduct its collection activities in these countries by commissioning appropriate local people or institutions especially at the initial stage. The UNU will, of course, also try to help them establish their own national archive while in the process of collecting materials. Usually these countries are obliged to put most of their emphasis and resources into economic development projects. There is always a strong irresistible political pressure to modernize their economies and social structures. Unfortunately most such activities are conducted at the cost of traditional technologies, life styles, and even values. Given the situation as it is today in most of these countries, there seems to be very little that they can do on their own to preserve what is preservable and worth preserving. Thus, the provision of co-ordination, guidance and some funds to plan and develop national archives will be among the important incentives the UNU can offer institutions in these countries. Combining the activities of establishing the Archive at UNU headquarters with a programme to help develop national archives in selected countries in each of the regions of the world is desirable. Thus, the proposed Archive at UNU headquarters need not be seen as an end in itself, but the beginning of a process of recognition, respect and concern for the traditional knowledge, skills and values which are facing destruction and replacement by modern life styles. If the activities of the UNU through its project of the Archive of Traditional Knowledge could help reinforce the self-confidence, self-respect and dignity of many traditional societies around the world, this will be a unique contribution in itself.

VI. Initial Subject Areas for Collection

The knowledge developed by human beings through their efforts to comprehend their role in the environment and secure

their position against all possible odds presented by that environment is vast. Traditional knowledge, therefore, covers a wide area of interests. Since the UNU can not begin collecting material in all areas at once, it will be necessary to limit the initial activities of the Archive to a few selected areas, some of which could coincide with te UNU's main interests. Tentatively, the following areas are being considered as possible candidates for initial systematic collection activities:

(a) Housing and habitat

Concepts of family shelter for both nuclear and extended families.
Concepts on clustering the extended family or family network, including landscape design of the clustered habitat.
Concepts of architecture, including relevance of house design to family structure, the environment and cultural and religious values.
Concepts for deciding the location of the habitat, including house and village siting.
Concepts of village landscaping, including choosing vegetation and locating water resources.

(b) Living and dying

Meaning and purpose of human life.
Meaning of old age.
Meaning of death.
Expectations after death.
Art and style of dying.

(c) Energy

Concepts for utilizing natural energy.
Concepts for providing energy from vegetation.
Concepts for providing energy from animals.

(d) Food preservation
Concepts for preparing fermented foods.
Concepts for drying meat and fish.
Concepts for conserving animals through habitat preservation and hunting schedules)

(e) Medicine

Concepts of various kinds of disease, and of sickness and health.
Concepts of various kinds of medication, their preparation, medicinal plant identification, and recognition of medicinal characteristics of animal parts.
Method of treatment through faith or prescription of medications

(f) Mechanisms for conflict resolution

Concepts of conflict and peace.
Concepts of tolerance.
Concepts of shame.
Concepts of prestige and status.
Methods of mediation and the role and selection of mediators.

VII. SUMMARY RECOMMENDATIONS

Much of the traditional knowledge is not only useful and viable in the societies they have served for centuries, but also could be useful and relevant in modern technologically advanced societies if properly studied and recorded, and made available to the people at large. The importance of the study of such traditional knowledge has been felt also because such knowledge has a tendency to be ignored and forgotten along with the accompanying life styles, in the face of the aggressive and glamorous modern life styles that traditional societies are now subjected to. There is a real danger of losing much of this valuable knowledge altogether unless an effort is made to preserve it.

The UNU is an appropriate place to begin a world-wide process of traditional knowledge collection. While developing the Archive in Tokyo, the UNU could also help many countries around the world to develop their own national archives of a similar type. The purpose of organizing the Archive is to collect valuable pre-modern knowledge not merely to save it, but also to make it available to individual scholars, teams of researchers and those people in search of solutions to problems and engaged in planning for the betterment of humanity at all levels. Naturally, those who could and should benefit most are the people who still lead a marginal existence and for whom economic development and reasonable levels of self-sufficiency have yet to be achieved. More significantly, many traditional societies which are losing interest and faith in the traditional knowledge and life styles, thereby losing a self-composed traditional dignity and self-respect, could be helped to restore and maintain the integrity of their self-image.

In addition to the establishment of the Archive itself, a world-wide network of collaborating scholars and institutions could be established to regularly collect and forward appropriate material for the Archive and provide access to their collections for possible duplication and inclusion in the Archive. Copies of all material obtained from national sources will be deposited in designated archives within the country, thereby encouraging the development and expansion of collections of traditional knowledge at the national level. The UNU Archive needs only duplicates of rare and unique material since it is knowledge which is collected and not objects of value in themselves.

The Archive will contribute in some measure to meeting the UNU Charter Mandate, as spelled out in Article VI, to:

"- promote exchanges of scholars, scientific and technical ideas and information within the world academic community, particularly in developing countries;

- serve as a depository of information regarding the expertise available on subjects of relevance to the work of the University, in co-operation with United Nations agencies and existing information systems; and

- maintain an up-to-date roster of qualified scholars from all parts of the world who are experts in the present and prospective fields of research of the University,..."

The Archive will have an exhibition area for photographs, maquettes or models, and videotapes and films. But essentially, it will be an information centre where people can consult materials on the spot or reproduce it for study outside the Archive. An important component will be the capability of the Archive to create material it requires for a thorough and systematic collection. In addition, users will be able to interact with the Archive by incorporating their own information and views and by offering corrections to information believed to be incorrect. Archive staff will be involved in synthesizing the material in the Archive along narrow themes, and to assist in the process of synthesis, users will be enouraged to contribute the results of their work in this direction as an integral part of the Archive. Facilities will be available to convene seminars and workshops on the premises of the Archive.

Even though the establishment of an Archive of Traditional Knowledge covers a vast area of activities with a vision for an increasingly important role well into the next century, it will begin modestly. In addition to the required administrative and technical staff, a few scholars and researchers will be involved in searching through the published literature as well as reports and dissertations for information on the selected topics. The scholars then could collect, collate and compare the available materials to help recommend a few sites or the locales in each of the major regions of the world for field visits and for further focussed searches on the selected topics.

As they work, the researchers might also note how best the appropriate traditional knowledge could provide alternative and better ways of dealing with new developments in industrial or post-industrial societies. Needless to say of course, much of the knowledge will be examined and tested with the help of the members of the relevant societies for possible improvement and reapplication by them. This would begin a process of practical application of an action research programme which the UNU envisages as one of its objectives.

During the process of organizing the Archive, several

experts knowledgeable people on traditional knowledge in several countries will be consulted. This will also help the UNU become more acquainted with the dimension and format of the project, and also to inform experts about the importance and urgency of such an effort. For most of the Third-World countries additional stress will be laid, during the consultation, on the relevance of traditional knowledge to the modern world and on its importance to the respective country's endogenous process of development and nation-building.

I. Introduction

Never before in history has there been so much knowledge and power available in the minds and hands of man. Modern science and technology have contributed in various ways to improve our lives materially. It has, for example, helped eradicate epidemics and endemic diseases from many parts of the world, increased life expectancy, and, through modern transportation and communications, brought people from far points of the earth together. Yet ironically, in the process of ever moving forward, there appears often a tendency to ignore the people themselves, who are to be, after all, the very beneficiaries of the entire developmental process. There is increasing concern about the prospect of science and technology becoming an end in itself and moving far ahead of large portions of the world's population, so that whole societies would be left confused, rather than enlightened, by some of the major achievements of science and technology.

There is a real danger of people becoming only the means, rather than the end, of the ultimate supremacy of the material achievements of science and technology. The present generation has observed many instances where people have been treated as mere quantities and as objects of development. There is, however, increasing concern among many who want to see a more balanced development, with an increased focus on human and social aspects of societies at all levels and in all parts of the world. Interest has been shown in the search for not only meaningful and happy ways of living but also, for example, for a peaceful and dignified way of dying as well. Many traditional societies respect and reward old age in a much better way and help old people die more peacefully and contented than in some industrialized societies. Old age in such traditional societies is looked upon as a positive stage in life unlike the societies where old age is treated as a problem.

Many people believe that the pre-industrial societies with their knowledge and insight into many natural phenomena have laid the foundation upon which the structure of modern knowledge was founded. Modern science is then seen as a continuation of man's efforts to understand and give meaning to his being. Knowledge is thus viewed as an inseparable link in a mosaic of relations which are forever transforming the continuity of that mosaic into something broader and richer. There are traditional societies which have not quite lost the inner harmony of their social and individual norms. They may provide an inspiration to peaceful living styles, but will have to be sought out and reinforced before they are swept away by the forceful tides of indiscriminate modernity.

Traditional pre-industrial knowledge has been acquired through intuition and trial and error, and repeatedly tested collectively within a society over generations. This knowledge

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A DEVELOPING COUNTRY RESPONSE TO PAT MOLHOLT'S "A VIEW FROM THE CHIP" THE INFLUENCE OF INFORMATION TECHNOLOGIES ON LIBRARIES AND LIBRARIANSHIP

by

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INTRODUCTION

1 The effect of any change, sociological, technological or otherwise, on society will depend on the interplay of socio-economic and environmental factors in which the society concerned is placed. Different societies, based on their respective needs and priorities, will react differently to the same agent or agents of change. There is a discernable difference between societal reaction to technological change (which respresents the actual, realistic and evolving response) as against the influence of technology on society and how society therefore should react to it in order to take advantage and benefit from it.

2 The literature abounds with generalisations made on libraries, the practice of library and information science and the use and effects of technologies on them in the less developed countries. The less developed countries (LDC) range from the very poor to those almost reaching developed country (DC) status. Depending on its governance, socio-cultural and economic situation, each country will naturally set its own priorities in the light of its own perception of its needs. This will of course have an effect on the relative situation of libraries in these countries. Suffice it to say that there exists a disparate development of libraries and information centres not only within each of these countries but also among them. It would therefore be impossible to make any generalisations on the impact of Information Technologies on them. What could be done though is to develop indicators which will help to chart pathways and which in turn will direct or guide the effective use of information technologies in these countries.

3 The ensuing comments therefore would be made in relation to the above situation. Another point that must be put across is that no matter how advanced the use of information technology (IT) is in the developed countries, we as librarians must not loose track of our basic purpose and objectives. The effect of IT on librarians would be the same regardless of whether they are in a developed or developing situation. The difference though would be on who gets to use it first. What is important in this respect from the developing country point of view is that lessons should be learnt and pitfalls avoided from the experience gained in developed situations.

4 As has been claimed, it is true that librarians suffer in terms of the status and recognition accorded to it. It must be added though that they should take a fair share of the blame as society determines the status of a profession based on the benefits it derives from that profession[1]. As reported by an Australian source[2], M.B. Line is purported to have stated that librarians have failed to take advantage of opportunities available to them due to their attitude which may be described as "a failure of intellect, imagination and initiative ..." If we are to carry ourselves "to a higher level of achievement and recognition" the need to do so should come from within.

5 Expert systems as offshoots of research on Artificial Intelligence (AI) are exciting and offer hope to our undervalued profession. It is the profession that must quickly take steps to get involved in the process of establishing and effectively utilising expert systems. Professionals in the field of computer science

and subject specialists themselves who possess knowledge in specific fields have entered the race. The development of a knowledge engineers may well dash our hopes of playing a major role unless we ourselves aspire to become knowledge engineers - but I am already beginning to tread on dangerous grounds. It cannot be denied though that we will have to adapt to the effect of technology and the use of it and in the process partake in both traditional and non-traditional roles of our profession.

6 I have always claimed that our tendency to use the computer to automate manual processes is in effect not using technology to advantage. What we must do though, is to be clear as to what we want to achieve and use the computer towards that end, based on the limits of computer capability. With advances in communications technology and its marriage with the computer and video micrographics the limits of technological capability are almost non-existent. What is essential is our effective harnessing of this technology in cost-effective terms to achieve our goals.

7 The access versus acquisition issue viewed from the developing country perspective is fraught with uncertainties of another kind. To start with very few less developed countries command good libraries and appropriate information resources - in short there exists an inequity in the availability of information between the developed and developing nations. There remains a great deal of dependence of the LDC' on the DC's to facilitate access to and transfer of information. Interdependence among nations, where a two-way flow exists can be construed as a reasonably healthy solution. When this balance alters and dependence is in one direction

only, attitudes on both sides change, price determination takes an almost monopolistic order and standards of service suffer from the very prompt and good to one of indifference.

8 On another plane, access greatly depends on the existence of appropriate communications infrastructure to connect to host data bases in various parts of the world. Not all LDC's can afford such infrastructure given their priorites determined by their economic cake. "Access" as we know it today takes care of part of the total information system i.e. it enables intellectual access to what is available and possibly where. Gaining physical access to that information is another part of the problem. Of course if one is willing to wait and pay exorbitant sums of money this problem does not arise. The existence of text files was introduced as an answer to the problem. Moralee[3] illustrates convincingly the limitations faced by electronic document handling. He advocates the combination of laser discs storing large bibliographic databases and video micrographics storing corresponding original documents. Such a combination allows for the possibility of LDC's having one national storehouse of information, which the whole nation can access. The establishment of a national store linking libraries in the nation using network technology could be one alternative to LDC's in coping with the effects of IT and in keep up with the latest.

9 The concept of the information centre as expoused is not only exciting but has set a direction towards which we should develop. As elaborated further an inordinate amount of integration, integrating software and hardware development to-gether with

co-operation of various professions and the private sector would be required to make the concept a reality. Our professional associations should be the forces which should influence the course of such developments.

10 Reading Koenig's paper and the author's paper that were cited, one is almost convinced that librarians are well in the road to becoming knowledge engineers. Much as I would like to believe it, the development of certain pre-requisites would be necessary to work our way towards such a goal. The attitudes of the profession must change. Greater involvement in processes intermediate to the establishment of expert systems is essential. Library schools must be bolder in building up professional capability towards requirements of knowledge engineers. Eliciting information from and getting the co-operation of subject experts is another problem to be contended with. There is a whole lot more than sees the eye. What is important though is our ability to predict future developments based on present and past events and to establish a sense of direction towards which we should develop.

11 The attractiveness of technological capability almost inevitably makes professions opt for it with a view towards enhancing immediate gain. What needs to be given greater thought though, is to the ramifications of a higher order on the use of technologies such that proper weight is given to an array of options taking into considerations judicious trade-offs. It may be that measures other than the immediate one at hand may prove to be more prudent and humanitarian in the totality of effects.

References

1. DRUCKER, Peter F.
Managing the public service institutions. College and Research Libaries, 37(1) : 4 - 14, 1976.

2. Librarianship as it is practised: a failure of intellect, imagination and initiative - Notes from a talk by Maurice Line In Incite 4(17) : 1, 6; 30 September 1983.

3. MORALEE, Dennis
Facing the limitations of electronic document handling. The Electronic Library 3(3) : 210 - 217, 1985.

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PROJECT EMPEROR-I:

China's Treasure Revealed via Videodisc Technology

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PROJECT EMPEROR-I:

CHINA'S TREASURE REVEALED VIA VIDEODISC TECHNOLOGY

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Abstract: Basic introduction to videodisc technology and the interactive videodisc, "The First Emperor of China" - the first product of PROJECT EMPEROR-I: China's Treasure Revealed via Videodisc Technology. Demonstrations will center on illustrating the enormous potential of videodisc technology for high-density, multi-media information processing, storage and dissemination, and interactive videodiscs for education, training and research.

INTRODUCTION

PROJECT EMPEROR-I: China's Treasure Revealed via Videodisc Technology is a major research and development project supported mainly by the Humanities Project in Libraries, US National Endowment for the Humanities (NEH). It applies the latest in videodisc technology in presenting and interpreting a major historical/archaeological period of China's past. The site and artifacts recorded and presented are from the period of the First Emperor of China (Qin Dynasty). During the Emperor's brief fifteen-year reign, his accomplishments included the institution of unified written scripts, the completion of the Great Wall, the unification of warring states, and the building of his magnificent tomb near Xian. The discovery of the 7,000 life-size terra-cotta figures of warriors and horses near his tomb is considered one of the most magnificent and significant archaeological finds of this century, and thus has captured the fascination of thousands and thousands of people all over the world (see Figure 1). PROJECT EMPEROR-I intends to present and interpret these fascinating subjects via interactive videodisc technology.

(Courtesy of PROJECT EMPEROR-I)

OBJECTIVES

PROJECT EMPEROR-I is a unique project that brings together the East and the West, the past and the present, humanities and high tech, and scholarship and applications. We intend to demonstrate how new technologies can help to provide much more efficient information processing, storage and delivery, and thus, in this case, to enhance better understanding and appreciation of humanities by delivering enormous multi-media, multi-formatted and multi-dimensional information in a way not possible before. It also introduces a new interactive educational and learning model through visual, audio and textual information on videodisc, which is used interactively with a micro-based system with developed coursewares.

PRODUCTS OF PROJECT EMPEROR-I

1. "The First Emperor of China" Disc

PROJECT EMPEROR-I's initial product is a set of two double-sided 12" NTSC CAV videodiscs, entitled "The First Emperor of

China: Qin Shi Huang Di, 秦始皇帝." Each of these discs contains 108,000 frames of visual images and one hour of audio tracks with narration and/or interviews in both English and Chinese, together with musical interludes. Sides 1 and 2 (the first disc) include over 200 segments of motion video from films and videotapes, and over 4,000 still frame slides. These visual information together with matching narrations in both English and Chinese are generally arranged in "chapters" like an electronic book. Each chapter deals with an identifiable topic, such as "Introduction on the First Emperor of China," "The Great Wall," and "Collection of the Qin Terra-Cotta Museum of Warriors and Horses." This arrangement enhances quick retrieval of the visual and audio information. Sides 3 and 4 (the second disc) contain essential oral history information - videotaped interviews with ten of the world's leading experts on the subject. Information is also arranged in chapters by questions asked of and answered by each expert.

2. Electronic Database

A comprehensive database is being constructed for those visual images on the videodisc. Each record includes approximately a dozen fields, such as disc side number, frame number, type of object, date of object, size of object, material of object, date of discovery, site where discovered, current location of object, information source, publication source, and comments. Thus one can interactively and simultaneously retrieve the desired textual, visual and audio information by using a micro-based interactive videodisc system, such as the Digital Equipment Corporation's Interactive Video Information System (IVIS).

3. Coursewares

Several computer-assisted instructional coursewares using our videodisc with DEC's IVIS system are being designed for various levels of users depending on their knowledge of the subject fields of Chinese art history and archaeology. At each given level, several computer assisted instructional lessons are being devised for the interactive system users, who will be led through each lesson step by step with the choices made from both the menus and sub-menus presented to them on the monitor screen. Concurrently, the desired visual, audio and textual information in whatever combinations selected by each system user will be provided online as ordered.

CONCLUSION

PROJECT EMPEROR-I, with its humanities-oriented subject matter, has enabled us to achieve our project objectives most effectively. Not only have we been able to offer both the general public and the subject specialists much visual grandeur, and instant multi-media information access on the subject through the use of videodisc technology, but also we have developed a

most comprehensive electronic database on the subject. This database includes much of the information which is not accessible nor obtainable before. In addition, this is a perfect research and development project for demonstrating fully the exciting opporotunities for using interactive videodisc in experimenting a with new mode of interactive learning and education.

ADDITIONAL INFORMATION

The following are a few selected publications on the project:

1. Altman, Howard. "The Emperor and the videodisc." Newton Tribune. 62 (81): 6, June 25, 1985.

2. Chen, Ching-chih, "Interactive videodisc & 'The First Emperor of China': Online access to multi-media information." Proceedings of the National Online Meeting. Medford, NJ: Learned Information, 1985.

3. Chen, Ching-chih, "Micro-based optical videodisc applications." Microcomputers for Information Management. 2 (4): 217-240, December 1985.

4. Chen, Ching-chih, "Online information and interactive videodisc technology: Case presentation about PROJECT EMPEROR-I." Proceedings of the 9th International Online Meeting. London: Learned Information, 1985, pp. 159-161.

5. "Data base development project explores China's past: Promotes videodisk as medium for information storage, retrieval." Computerworld Special Report. pp. 22-23, June 24, 1985.

6. "Simmons project tracks treasures of Qin dynasty with new technology." American Libraries. 17 (3): 215, March 1986.

7. Slavin, Lois, "IVIS helps document archaeological finds from ancient China." DEC US Field News. 8 (3): 1-2, 1985.

8. White, Laura, "China's Emperor I: A pocket history - Simmons dean to capture an era on videodisc." Boston Globe. pp. B14, B16, February 17, 1985.

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